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TRANSMITTAL OF APPEAL BRIEF (Large Entity)	Docket No. 4629

In Re Application Of: **Carroll et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/782,089	February 12, 2001	Daniel St Cyr		2878	

Invention: **Automated Reactor Endpointing of Platy Interference Effect Pigment**

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Dated: **06/09/05**

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Application No. **09/782,089**	Filing Date **February 12, 2001**	Examiner **Daniel St Cyr**	Customer No.	Group Art Unit **2787**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Carroll et al.	Art Unit: 2878
Serial No: 09/782,089	Examiner: Daniel St Cyr
Filing Date: February 12, 2001	
Title: *Automated Reactor Endpointing of Platy Interference Effect Pigment*	Atty. Docket No.: 4629

APPEAL BRIEF

Commissioner of Patents
and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the Final Rejection dated January 25, 2005.

REAL PARTY IN INTEREST

The real party in interest of this application is Engelhard Corporation.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF THE CLAIMS

Claims 7-10 and 12 of the present application have been Finally Rejected and are the subject of this appeal.

STATUS OF AMENDMENTS

An Amendment under 37 C.F.R. § 116 was filed April 4, 2005 requesting cancellation of claims 1-6. This amendment is believed to have been entered by the Examiner.

SUMMARY OF INVENTION

The present invention is directed to a method for objectively ascertaining a color match between a selected standard color and the color exhibited by an interference effect pigment slurry during the preparation of the pigment, and terminating the preparation of the pigment upon achieving a proper color match, page 4, lines 12-15.

Interference effect pigments, also known as pearlescent pigments, or macreous pigments, are based on platy substrates which have been coated with a metal oxide layer or layers. These pigments exhibit a pearl-like luster as a result of multiple reflections and refractions of light as light encounters the various layers which constitute the pigment, page 1, lines 16-21. The interference effect pigments are made by coating a platy substrate such as mica with a hydrous layer followed by calcining the composite. The color generated by the pigment is a function of the optical thickness of the coating, which in turn is a function of the refractive index of the coating and physical thickness of the

coating. The physical thickness of the coating is a function of the coating process and the parameters and conditions of the process, page 1, lines 22-page 2, line 5.

The ultimate color of the interference pigment product is complicated by the fact that free particles of the coating, unattached to the platy substrate, can form and effect the apparent color. Importantly, the color of the effect pigment changes rapidly as a result of high reaction rates as the hydrous coating is applied to the platy substrate. To use known methods of color monitoring, the manufacturing (coating) process must be halted, a sample of the in-process material obtained and dried, and also calcined if the end product is intended to be calcined, and then the resulting color characteristics must be compared to a standard, page 2, lines 6-13. Accordingly, to accurately monitor color of the formed pigment, it would be necessary to obtain and dry a sample of the pigment, suspend the pigment in a coating carrier, and coat a color evaluation substrate before evaluating the color. This is impractical and time consuming. Typically, therefore, interference effect pigment processing involves a simple, subjective visual observation of the pigment dispersion as the hydrous coating is being formed on the substrate, and maintaining the processing conditions as close to predetermined parameters as practical, page 2, lines 14-21.

The present invention provides a method for objectively ascertaining a color match between a selected standard color and the color exhibited by an interference effect pigment dispersion during pigment preparation so as to allow termination of the preparation upon achieving a match, page 2, lines 22-25. To monitor the interference effect pigment color during the processing thereof, and to terminate the processing when the desired color is found, an apparatus is provided that includes a flow cell that receives

a pigment dispersion from a reaction flask or reactor in which the interference effect pigment is being produced, page 4, lines 15-17. The flow cell 20, see Figure 1, receives a stream of the pigment dispersion from the reactor as the pigment is produced. As shown in Figure 1, a goniospectrophotometer 10 is provided which is capable of measuring at an angle 12 the interference color of the pigment dispersion 22 that is passing through the flow cell 20. The goniospectrophotometer monitors the pigment color of the pigment dispersion 22 during development of the interference pigment and, in particular, during the application of the hydrous layers on the platy substrate, in real time. This reduces the time in which a pigment dispersion is held during evaluation and prior to completion. A description of Figure 1 is provided at page 5, lines 3-24. When the goniospectrophotometer measures a color from the pigment dispersion flowing through the flow cell that matches a standard for the particular color desired, the pigment forming process in the reactor can be halted, page 7, lines 14-15. In this manner, conventional monitoring processes which involve obtaining, filtering, and calcining a sample which is then suspended in a carrier and drawn over a substrate for color comparison can be avoided. The present invention eliminates these time consuming steps, page 5, line 25-page 6, line 5. Further, in addition to reducing holding time, the invention also provides for an objective evaluation of product color, page 6, lines 6-7.

ISSUE

Whether Finally Rejected claims 7-10 and 12 have been properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Falcoff *et al.*, U.S. Patent No. 4,403,866 in view of Phillips *et al.*, U.S. Patent No. 6,241,858.

GROUPING OF CLAIMS

Claims 7-9 are separately patentable from claims 10 and 12.

ARGUMENT

The Examiner has Finally Rejected claims 7-10 and 12 under 35 U.S.C. § 103(a) as being unpatentable over Falcoff *et al.* (U.S. Patent 4,403,866) in view of Phillips *et al.* (U.S. Patent 6,241,858). According to the Examiner, Falcoff *et al.* discloses "a process for making paints comprising: an interference effect pigment reactor 13; a flow cell in communication with the reactor; and a colorimeter, interface with said flow cell for measuring the characteristics of the flow cell sample, such as L*, a* and b* values of the paint being prepared." See Final Rejection at page 2, last paragraph. The Examiner further contends that Phillips *et al.* discloses "a method and apparatus for producing enhanced interference pigments comprising: means for establishing color difference by measuring the L*, a* and b* values of the light beams, wherein a goniospectrophotometer is used at angles 10-60 degrees for taking the measurement; a very thin coating of mica (about 1 mil thick) is used on the surface material of TiO2 (high refractive index material) to produce the best chromatic colors." See Final Rejection at page 3, third paragraph. The Examiner then concludes that "[i]n view of Phillips et al's teachings, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to modify the teaching of Falcoff *et al.* to employ a

goniospectrophotometer in lieu of the colorimeter for describing color shifting pigments." See Final Rejection at page 3, third paragraph.

Falcoff et al. does not teach a method of pigment preparation comprising coating a platy substrate with a hydrous layer

The invention as presently claimed is directed to a "[m]ethod for continuously controlling color of an interference effect pigment during pigment preparation comprising coating a platy substrate with a hydrous layer to form a pigment." See claim 7 (emphasis added). Whereas, Falcoff *et al.* is directed to a method of mixing paints. According to Falcoff *et al.*,

> the computer determines the amount of each of the colorants that is to be added to bring the paint within the tolerance values for the paint and activates the metering pumps which feed colorants into a mixing vessel. The above procedure, commonly called shading, being repeated until the paint being prepared is within L*, a*, and b* tolerance values of the paint.

See col. 4, line 68 through col. 5, line 6 (emphasis added). Falcoff *et al.* is specifically concerned with forming a liquid paint and controlling the color of the liquid paint, not the color of a specific pigment, which forms the paint. Thus, there is no pigment coating reaction that takes place, rather only the mixing of different colorants until the correct ratio is realized to give the desired color. In contrast, and as previously described, the present invention is directed to a method of producing a hydrous layer coated pigment. Falcoff *et al.* does not teach or suggest a method of pigment preparation. Furthermore, Falcoff *et al.* does not teach or suggest comprising coating a platy substrate with a hydrous layer to form a pigment. Falcoff *et al.* only discloses a method of mixing multiple colorants to achieve a desired paint color. Therefore, Appellants respectfully

submit that Falcoff *et al.* does disclose or suggest all the claim limitations of the present invention.

The Examiner states that "[w]ith respect to coating a hydrous layer onto said platy substrate to form the pigment, applicant has admitted that such a process is very common in the art, which therefore, obvious." See Final Rejection at page 4, second paragraph. Appellants readily admit that coating a hydrous layer to form an interference pigment is common in the art, however, the continuous monitoring of the color achieved by the coated substrate (pigment) so that the coating process can be continued or terminated has not previously been done. The Examiner cannot rely on the disclosure of the present invention in Appellant's own application to find that the claimed invention is obvious.

Phillip et al. does not overcome the failure of Falcoff et al. to teach pigment preparation comprising coating a platy substrate with a hydrous layer

The Examiner points out that Phillip *et al.* discloses the use of a goniospectrophotometer. However, Phillips *et al.* does not teach or suggest a continuously controlled method of pigment preparation, wherein said pigment is prepared by coating a platy substrate with a hydrous layer to form a pigment. See claim 7. Rather, Phillips *et al.* differs in at least this one key respect, Phillips *et al.* discloses a method "for uniformly depositing a coating material from a vaporization source onto a powdered substrate material to form a thin coalescence film." See the Abstract of Phillips *et al.* (emphasis added). As opposed to Phillips *et al.,* the interference pigments of the present invention are made by coating a platy substrate such as mica with a hydrous layer. Therefore, Phillips *et al.* fails to disclose all the limitations of the present invention, and does not and cannot render the present invention obvious.

Phillip et al. does not teach or suggest the use of a continuous process

The Examiner contends that Phillips *et al.* discloses a continuous method stating that Phillip *et al.* "continuously monitor the content by taking measurement [sic] at different angles until a proper match is achieved." See Office Action at page 4, third paragraph (emphasis added). Appellants respectfully disagree.

The Examiner has failed to provide support for this contention. Despite Appellants good faith effort to identify such support in Phillips *et al.*, Appellants have been unable to do so, and do not believe that such support can be found. Specifically, Phillips *et al.*'s teachings regarding color management are not conducted while the pigment is being made by a coating process. More specifically, it is clear from Examples 8-10 of Phillips *et al.* that the method used in Phillips *et al.* requires forming a pigment, filtering, calcining the sample, suspending the pigment in a carrier, coating a paper card with the sample, and comparing the interference effects of the dried sample with a standard. Phillips *et al.* clearly demonstrate that a sample is sprayed out on white or black paper background for evaluation. See, *e.g.*, Examples 8-10, col. 22, line 4 through col. 24, line 39. This process of pigment evaluation is well known. See Specification at page 2, lines 14-21. The pigments of the present invention are not evaluated in this prior art cumbersome manner. Rather, the present invention eliminates these time consuming steps, as well as the inevitable delays, which occur in the real world execution of this

conventional process. In fact, the present invention is directed to a method for continuously controlling the color during pigment preparation wherein:

> [d]uring the process of forming the pigment, a substrate, such as mica, is coated with a high refractive index material, generating an interference color. To evaluate the coating process and the interference color, an aliquot of the dispersion of in-process platy effect pigment is pumped through the flow cell 20. Light 30 emitted from an emitter 32 reflects off the pigment dispersion 22. The color of the reflected light 34 is measured at predetermined time intervals. When the reflected light color matches the reflected light characteristics of a selected dispersion standard, the coating process is halted.

See Specification at page 7, lines 8-15. Phillips *et al.* does not teach or suggest the use of a "[m]ethod for continuously controlling color of an interference effect pigment during pigment preparation comprising coating a platy substrate with a hydrous layer to form a pigment." See claim 7 (emphasis added). In fact, Phillips *et al.* is not remotely concerned with continuing or terminating the continuous reaction process claimed in the present invention. Thus, Phillips *et al.* does not and cannot render the claimed invention obvious.

Falcoff et al. does not teach the reaction method of the present invention

The Examiner also states that, the function of the apparatus disclosed in Falcoff *et al.* "serves the same function as the claimed reactor… to process the paint so as to form specific pigments for color matching." See Office Action at page 4, second paragraph (emphasis added). Appellants respectfully contest this assertion.

Appellants respectfully point out that nowhere in Falcoff *et al.* is an "interference effect pigment reactor" disclosed as the Examiner contends. In fact, Falcoff *et al.* does not even suggest the use of an "interference effect pigment reactor," but rather only

discloses a paint mixer. Falcoff *et al.* states, "the components used to make the paint are metered into a mixing vessel 13 containing a mixer 14 having a mixing blade attached to a shaft and driven by a motor 15. The components are thoroughly mixed ..." See col. 3, line 55 to line 58 (emphasis added). While it is true that both Falcoff *et al.*, and the Appellants disclose "an apparatus," Appellants have pointed out above, the key differences between the methods of the present invention and those of Falcoff *et al.* Specifically, that Falcoff *et al.* does not disclose a method for "pigment preparation comprising coating a platy substrate with a hydrous layer to form a pigment." See claim 7 (emphasis added). Furthermore, in the interests of furthering prosecution, and placing the claims in better position for appeal, Appellants have cancelled all claims relating to the disclosed apparatus of the present invention.

The invention as presently claimed is not rendered obvious by the combination of Falcoff et al. and Phillip et al.

Falcoff *et al.* does not and cannot render the claims of the present invention obvious to one of skill in the art, because Falcoff *et al.* fails to disclose or suggest all of the claim limitations of the present invention. This deficiency in not overcome by combining the teachings or suggestions of Phillips *et al.* with Falcoff *et al.* Similarly, Phillips *et al.* does not teach or suggest the coating of a platy substrate with a hydrous layer to form a pigment. Furthermore, Phillips *et al.* fails to disclose a method of continuously controlling pigment preparation. It is the monitoring of the color achieved by the pigment itself during formation of the pigment, which is the essence of this invention and is a process not taught or suggested in either of the references alone or in combination. Appellants respectfully point out that the invention as presently claimed

cannot be and is not rendered obvious by the combination of Falcoff *et al.* and Phillips *et al.* Therefore, Appellants respectfully request that the rejection of claims 7-10 and 12 based on 35 U.S.C. § 103(a) be reversed.

CONCLUSIONS

In view of the above, Appellants respectfully request the Board of Appeals reverse the final rejection of claims 7-10 and 12 over the applied references. An appendix to the appeal brief sets forth claims 7-10 and 12, which are on appeal.

Respectfully submitted,

June 9, 2005
Date

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APPENDIX OF CLAIMS

7. Method for continuously controlling color of an interference effect pigment during the pigment preparation comprising coating a platy substrate with a hydrous layer to form a pigment, providing a flow cell with an oriented sample of said pigment being formed, impinging light on said sample, comparing a characteristic of light reflected from said sample of the pigment with a standard, and terminating said coating when the characteristic corresponds with the standard.

8. Method of claim 7, wherein the characteristic is a characteristic of an interference effect of light reflected from the pigment.

9. Method of claim 7, wherein said comparing a characteristic of light comprises comparing wavelength, dominant wavelength, color space parameters or a combination thereof.

10. Method of claim 7, wherein said sample comprises mica coated with high refractive index material.

12. Method of claim 7, wherein said flow cell is a thin layer flow cell and the method further comprises providing a sample of the pigment being formed to said flow cell.